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ABSTRACT

This paper by James L. Angel, Director, Medical College Admissions Assessment Program, Association of American Medical Colleges, was presented at the 1976 annual meeting of the American Association for the Advancement of Science. Discussed are various issues and factors considered in the development of the new Medical College Admissions Test to be introduced in 1977, a description of the development project producing the new test, and an outline of the content and objectives of the new test. (SL)

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THE NEW MEDICAL COLLEGE ADMISSIONS TESTS℠: NEW DIMENSIONS IN ASSESSMENT

by

James L. Angel

The three to one ratio of applicants to available first year positions in medical school assures that two of every three candidates will be delayed or stopped by barriers erected by the admissions process. Admissions is complex, and demands the utmost in energy, careful thought, and comparison if all competitors are to be treated fairly.

One element of the barrier (or gateway for one third) is the Medical College Admission Test (MCAT). The significance of the MCAT is highlighted by its successful history as a cognitive predictor of success in the medical school, and the consequent reliance admissions committees place on it as a measure of academic achievement in preparation for medical school.

The power of the MCAT as an admission variable is based on the weight given to the scores by committees in relation to grade point averages and indicators of personal qualities obtained through interview, autobiographies, letters from advisors, and other relevant background information. If an admissions committee relies on cognitive data (MCAT scores, grade point averages) as prime selector variables, then MCATs and school performance records as barriers to admissions become highly significant factors. If personal qualities are studied carefully through available evaluation procedures and balanced in importance with tests and grades, then the importance of MCATs as barriers is diminished, and other selection procedures (assessment techniques) rise in importance.

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I will address the MCAT as an admissions barrier for minorities, but I will alter from simply historical perspective since the instrument is undergoing major change, and new tests with new objectives will be introduced in 1977. The current MCAT will see its last use in Fall, 1976.

It is not presumptuous to say that a major reason for revising the MCAT has to do with concerns about its importance in admissions and its ultimate effect on minorities. Social emphasis on the need for quality and availability of health care are also prime concerns, and admissions officers are constantly criticized for "not selecting the right students", thus contributing to current health care problems. I doubt if any of us would accept this simplistic criticism at face value, but it draws attention to the important role as gateway or barrier played by the admissions committee.

Selection is an imprecise science, but the Association of American Medical Colleges (AAMC) is committed to a major effort to improve both cognitive and non-cognitive assessment instruments and techniques (such as interviews) used in admissions. I will discuss the MCAT today, but future reports out of AAMC will reflect the heavy emphasis being placed on assessment of personal qualities at admissions in relation to expected qualities to be found in the competent, concerned physician.

The issues discussed here are based on 1) the MCAT as an admission tool, especially as it relates to minority applicants, and 2) the efforts now under way at AAMC to improve the overall quality of assessment procedures used for selecting applicants for positions in medical school.

The current high status of the physician's career makes entrance into medical school a prized possession for many people. Statistics are well known on number of candidates and number of positions available in medical schools. About 45,000 students file over 300,000 applications for about 15,300 entering

positions each year. This intense competition historically has worked to the disadvantage of minorities. A disproportionate number of minorities have never had opportunity to consider a physician's career as a possibility--a serious problem not within my pervue to discuss now but within the objectives of this conference. I bypass this significant segment of history to discuss a few of the steps taken by AAMC to attack the problems created by this inequity and to open up new avenues of opportunity that might lead to equal opportunity in education, in social mobility, in aspirations, and in acqusition.

In the late 60's, when much of our society was being sensitized by the social turmoil going on in the country, AAMC began to examine thoroughly its role in society, emerging with aggressive, positive responses to the various pressures and opportunities afforded by the climate of the times. An early step was creation of the Office of Minority Affairs, headed by Dario Prieto, which has had wide involvement in and impact on basic issues plaguing our society in relationship to minority participation. The office has received constant generous support from the Association and its constituent schools, and has taken firm action in responding to pressing social concerns. AAMC's constituents (the medical schools and teaching hospitals) have made significant advances in recruiting and training members of minority groups to become full-fledged members of the medical profession. Many admissions committees have attempted to evaluate candidates in a way that will identify personal potentials that may be hidden by factors such as slightly lower GPA's or MCAT scores, cultural-ethnic inhibitions, or prejudices of the reviewing committee.

The Council of Deans of the Association of American Medical Colleges, through a report of an ad hoc committee convened in 1971, outlined significant steps it felt that the Association and its constituents should take in examining the admissions process (AAMC, 1971). The pressure of inordinate numbers of applicants, concern over minority representation in the applicant

pool and in admitted classes, and a general feeling of concern about the approach used by schools in evaluating candidates prompted the recommendations.

AAMC's Division of Educational Measurement and Research, under Dr. James Erdmann, began an immediate study to determine best ways to respond to this report. A survey with a group of constituents indicated strong support for studies to be conducted in admissions, with MCAT being an important part of this review. From this support, the Medical College Admissions Assessment Program (MCAAP) was organized. MCAAP is a broad-based program to study both cognitive and non-cognitive factors of the assessment techniques used in admissions, relating such a study both to the selection procedures and problems of prediction encountered in any admissions techniques. Through MCAAP, a task force was organized from constituents, including deans, admissions officers, students, faculty, and researchers in medical schools, as well as preprofessional advisors and representatives from related agencies such as the National Board of Medical Examiners and the AMA Liason Committee on Medical Education. This task force, under chairmanship of Thomas Meikle, M. D., of Cornell School of Medicine, formulated recommendations which became the bases for Executive Council action and guidelines for the MCAAP study.

The MCAAP developmental effort has had the continued and extensive involvement of minorities and women. Based on the premise that the concerns and interests of any group will be better protected by full involvement of that group, MCAAP has been an open study incorporating knowledgeable and informed people from its inception. The following review will indicate how this participation has occurred and demonstrate the broad reliance on members from many groups to work within the study.

A full description of project activities is beyond the scope of this report. The three stages I will cover are: 1) planning for MCAAP projects, 2) the national task force, and 3) cognitive test development. These should

demonstrate the points to be made today regarding barriers to a career as a physician.

Initially, guidelines for participation of constituents were prepared and, in cooperation with AAMC's Office of Minority Affairs, a carefully conceived plan for full involvement of minority members and women was designed. (The women's plan is not a part of this presentation.)

1. Through discussions with leaders from various minority sectors, mostly health related, an ad hoc committee for minority concerns in MCAAP was formed immediately. Its purpose was to formulate a carefully conceived position paper that would take into account the significant issues related to minorities' access to medical school, with special emphasis on admissions screening techniques and their impact on minorities. Chaired by Dr. John Watson, University of California, San Francisco School of Medicine, this committee developed a paper that became an instrumental statement in the deliberations of the MCAAP national task force, organized shortly thereafter.

The position paper recommended a) development of a new standardized cognitive test, b) research to find improved ways to assess personal qualities of applicants, c) full validation studies of assessment instruments, d) future consideration of a criterion-referenced admissions exam, and e) strengthened counseling and advising resources.

It was proposed that the science disciplines of biology, chemistry, and physics be presented separately in the new tests, and that skills in handling of written materials be assessed.

For summary, the committee strongly urged a new test, related to the study and practice of medicine, that presents applicants with tasks which fairly assess their knowledge and skills. Assessment should be relevant and provide the means by which students demonstrate their preparation for medical school.

2. Through a series of regional conferences and related meetings a national task force emerged. It provided a broad base for constituent input from medical and premedical levels. Besides the paper described above, position papers were presented by medical school deans, admissions officers, undergraduate advisors, a committee studying personality assessment, and several individuals.

The task force was comprised of nearly one third minority members, assuring not just adequate representation, but a full cohort of voices to debate and discuss issues. Briefly, the recommendations of the task force cover the following: 1) An advisory committee within AAMC will maintain constant surveilance of admissions processes, to assure ongoing research and to produce the best possible techniques and measuring instruments for selection of candidates. This committee has been formed, chaired by Cheves Smythe, University of Texas Medical School at Houston. 2) Validation of assessment instruments or techniques is an integral part of MCAAP. This means that assessment instruments are to be researched constantly to determine their validity as selection devices. Content, face, and concurrent validity are essential first steps, but a long-term effort will be launched to study admissions variables for their usefulness as predictors for success in medical school and practice. 3) The current MCAT (a decent predictor of success in medical basic sciences) is being used until new tests are ready. 4) New cognitive examinations are to replace the MCAT. To be introduced in 1977, they assess a student's ability to work with information in written or quantitative form, test knowledge and problem solving skills through separate exams in biology, chemistry, and physics. In the future, additional areas will be considered in which students may demonstrate proficiency, with behavioral sciences an early possibility. 5) Assessment of non-intellectual (non-cognitive)

factors of human behavior is the focus of a major proposal at AAMC, which incorporates a research design for the project and suggests a course of action for conducting the necessary studies. The extent of this project will require outside resources to assure that it can be appropriately carried out. 6) A major information program has been launched, with intent to establish communication with admissions officers, applicants, advisors and researchers. An initial manual in the cognitive assessment project describes the new exams in detail. Later manuals will present test content and sample questions prior to test administration, score interpretation, use of exams in counseling, significant research efforts, and other topics.

3. The third stage, cognitive test development, represents one of the most extensive efforts to date to attack the barriers facing students wishing to enter medical practice. The MCAAP Task Force Report clearly stated that every effort must be made to provide an assessment process for admissions which is quitable, does not create conditions where "special" treatment has to be accorded to any person, and where the assessment of knowledge and skills is relevant to the task at hand. This means program objectives, specific goals, and programs designed to move us away from concepts such as disadvantaged, minorities, special groups, reverse discrimination, and other "phrases of inequity".

Through fully pledged support of the Executive Council of AAMC, a request for proposal was submitted to contractors in this country who could offer innovative ways to attack the problems at issue in cognitive assessment. Five major proposals of striking quality were received in response. Careful independent evaluations were conducted, including evaluations from minority members and women in medicine. The contract went to the American Institutes for Research (AIR) on two premises. First was their suggestion of an innovative procedure by which important prerequisites for the study and practice of medicine could be identified. Second was their proposal for

full participation and involvement by underrepresented groups. Their proposal, coupled with AAMC's plan for full communication with users, should result in a significant advance in admissions testing.

The contributions of minorities to all project activities is a key factor in development of the new exams. Careful construction of specifications and questions utilizing extensive involvement of minority group members in each phase was one significant step. A brief discussion of that process follows.

The content upon which any test is based becomes the determinant for content validity. Validation procedures usually involve a set of judgments by informed people who determine the important elements of knowledge and skills which should be assessed as prerequisites to study. The proposal from AIR expanded on this concept considerably.

Comprehensive outlines of science knowledge were developed in biology, chemistry and physics. Skills considered important in the study and practice of medicine were identified and listed. Types of materials from which most information is gleaned were identified and entered in the outline. A survey booklet was then organized for all of this material, and invitations were extended to over three hundred persons from medical education and practice to serve as evaluators. Approximately 160 actually participated in the ratings. Their task was to rate knowledge topics, skills, and source materials on the basis of their importance as prerequisites to the study of medicine, and to rate the outline a second time, this time evaluating in terms of importance as prerequisites to the practice of medicine.

Over one tenth of the raters on this national survey panel were minorities. This meant that the numbers were nearly representative of the general population, but markedly overrepresented in relationship to the numbers of minorities in

medical education or practice. This latter was deliberate, however, since it was more important to get an adequate population for reliable ratings, than it was to have a representative population.

In brief summary, the evidence shows broad agreement among both non-minorities and minorities as to important prerequisites for the study and practice of medicine. A full report on this study will be forthcoming within the next year, but the importance of this preliminary information rests in the identification of the important prerequisites and in the level of agreement found among the clusters of raters analyzed. This gives evidence that there may be a certain basic level of science knowledge and certain types of skills required for the study and practice of medicine, regardless of background.

With this information, AIR has proceeded to develop a set of specifications for the new admissions examination, basing it entirely on knowledge and skills judged by the raters as important in medical education or in practice. Nothing else will end up in the test. Topics were eliminated if they did not obtain adequate support from the panelists. Thus there should be no irrelevant material in any of the six tests, using the panel results as a guide.

Several other steps have been followed in the preparation of the new exams to provide an equitable assessment tool. One has been the wide use of minorities as item writers. Another has been extensive review of every test item by minorities and women, looking both for cultural and sex bias. Third, and a most significant feature, has been the tryout of items with several hundred students, especially minorities, from undergraduate universities in many parts of the country. Students have had opportunity to work the items, evaluate them in terms of bias or other standards of quality, and to provide open critiques with other students and local university faculty members. On the basis of these reviews, AIR has been able to remove items judged by students to be discriminatory, of poor quality, tricky, or otherwise inappropriate.

Careful studies are done with all data to uncover indications of any problems that might arise with the exams. Research is constant to assure early adjustment for any inequities which might appear. Basically, the procedure in this project is the most extensive ever undertaken to develop a standardized admissions assessment instrument that will be relevant, technically sound, and equitable, to the extent humanly possible, for every person wanting to obtain a coveted place in medical school.

Anxiety for many students reaches inordinate levels as they seek admission to medical school. Part of the problem is posed by admission testing, which is always a point of apprehension and puzzle to many. In the case of the MCAT, students have not been aware of content other than in the general sense. Furthermore, they have been misdirected by commercial publications which do not always give appropriate emphasis when describing the tests.

Strong support has been given by admissions officers and AAMC staff to the concept of providing complete information to students about content to be measured. American Institutes for Research has based the entire test development process on the assumption that students will be told the topics to be covered by the test, the types of skills to be assessed, and the nature of materials from which test items are to be drawn. Consequently, a manual is being introduced presenting the complete outline of topics in science knowledge which students should know, the description and definition of skills to be assessed, and a discussion of the types of source materials to be incorporated. Sample items will be included in this manual to acquaint students with types of questions to be on the New MCAT and to give realistic work experiences that should be of most help in their preparation. Frankly, it is expected that no student will need to go to a commercial organization to obtain preparatory information for the new admissions testing program. AAMC feels a deep obligation to students, advisors, and admissions officers to furnish the essential ingredients for appropriate use of the new exams.

Student information will be followed in the winter of 1976-77 by a national workshop for admissions officers to introduce them to the test, its scoring procedures, and its potential for use in admissions. Premedical advisors will have access to all materials, including instructions for use of the examinations in counceling and advising. Technical manuals will be furnished for researchers and others interested in the technical quality of the tests and how they conform to professional standards.

Medical schools and individual researchers from the United States and Canada, along with interested parties from other countries, will be invited to take part in validation studies and other research efforts in the new program. Evaluation of performance as students and physicians is an important part of the establishment of criteria against which admissions variables are studied. Linking common behaviors along the medical education and practice continuum, and extending them downward to assessment of applicants, is an important task yet to be completed. AAMC is presently conducting a major research study which should contribute to this effort, a longitudinal study originally started with medical students of the entering class of 1956. Twenty-eight schools are involved in this study, along with a cohort of some 2,500 physicians who graduated from those schools in 1960. This cohort is participating in a major study linking the various admissions and performance variables of the 1956-60 period with current experiences in their practices. This study promised to bring many benefits to the validation research of the current project.

The MCAAP Task Force had proposed that a new longitudinal study be started with our current students. We believe that the introduction of the new cognitive test as well as the plans for the improved assessment of personal qualities of candidates should be a logical starting point for a new study. Thus, the first elements of a comprehensive longitudinal design are being considered which should result in a continuing systematic effort to improve the quality of candidate selection.

This presentation does not make the assumption that the inequities of admissions to medical school are all going to disappear with the advent of better assessment procedures. We take into account that solution of inequities is a major social and personal responsibility. We contend, though, that the effect of over emphasis on cognitive criteria for admissions has been harmful to many candidates, and especially so for minorities. Improved cognitive instruments may assure more equitable measures of candidates, but they cannot remove the tendency of certain admission committees to place too much reliance on cognitive information.

Most admissions committees work constantly to establish better procedures for assessing personal qualities of candiddates, but some observers see a need to take more risks in relationship to committees' judgments about those qualities. This maybe the only way in which selection criteria can be expanded to offset the detrimental effect of overreliance on grades and test scores.

Our predictors, whether they be cognitive or non-cognitive in focus, should be looking for the unusual indications of potential--that potential which does not always lend itself to easy dicision making such as can be done with the ranking of test scores. We submit that the profile for persons admitted to medical school should some day be quite parallel to the profile of physicians needed to deliver quality health care in this country.

Suspicions are widespread that our physician recruitment and training system has not always produced responsive, ethical, compentent physicians. Evidence shows that only in the past decade or so has there been expanded, diligent efforts to remove barriers to medical school and practice for women and minorities. The fact that nearly fifty percent of the minority applicants are admitted to medical school in contrast to a one out of three rate of acceptance for all applicants gives concrete evidence of improved attention to the problem.

Further work needs to be done in recruiting minorites for our applicant pool. Studies as recent as 1972 show that only 4.7 percent of Black college freshmen were planning professional medical careers (Johnson et al. 1975). More recent evidence shows that the applicant pool of minorities seeking entrance to medical school has leveled off, and enrollments show a slight decline. These are problems that go beyond the MCAT. We would hope, however, that the broad involvement of women and minorities in the planning and construction of a new admission test for medical school will be one significant step in removing barriers for persons who, first of all, have been denied access, and second, are most needed in order to significantly strengthen the country's health care delivery system.

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